

**Sandia National Laboratories**Operated for the U.S. Department of Energy by  
**Sandia Corporation**

Albuquerque, New Mexico 87185-1120

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DEPARTMENT OF TRANSPORTATION

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DOCKET SECTION

date: February 9, 1999

to: Associate Administrator for Hazardous Material Safety  
Research and Special Administration  
US, Department of Transportation  
400 7th Street SW, Room 8436  
Washington DC 20509-001  
Attention: Exemptions, DHM-31  
c/o Ms. Ann Mazzullo,

RSPA-98-4609-5

from: Lacey Learson, MS-1120 (Org: 10201)  
Hazardous Material Consultant

subject: Return of the Multi-spectral **Thermal Imaging (MTI)** Satellite Payload containing Ammonia **Anhydrous**, Helium and Nitrogen compressed **gases, DOT E-12153.**

**Ref:** 1. Memo, **Lacey Learson** to Ms. Ann Mazzullo, dtd September 30, 1998, Subject: Emergency Packaging Exemption for Shipping the Multi-spectral Thermal Imaging (MTI) Satellite Payload containing Ammonia **Anhydrous**, Helium and Nitrogen compressed gases.

**Sandia National Laboratories**, Albuquerque (**SNLA**) is requesting an additional **90 day** extension for DOT exemption **E-12153**. Engineers at **SNLA** were delayed in shipping the **MTI** Satellite to Los **Alamos National Laboratory (LANL)**. In return, **LANL** is also delayed in returning the **MTI** Satellite to **SNLA**. The delays are due to technical problems with the **MTI** Satellite. The unforeseen delays have used up some lead-time that was generated into the time-schedule of the **MTI** Satellite. The original emergency exemption has expired, the special testing and calibration at **LANL** is still in process. The earliest the Satellite can be returned to Sandia is the first week in March if no other delays are encountered.

Once again it is imperative that the request for the extension be granted to Sandia National Laboratories in order for Los **Alamos National Laboratory** to return the **MTI** Satellite to Sandia during the first week in March. The extension is needed by March 1, 1999 to prevent further schedule delay. Any help you can render would be very much appreciated. If there is any additional information that I can provide please do not hesitate to contact me, my phone number is (505) 844-3144. In order to receive the extension in a timely manner my fax number is (505) 844-5013.

Again, thank you for your help.

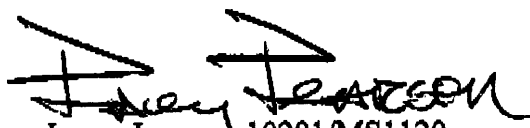
LL: 10201/MS1120

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**date:** September 30, 1998

**to:** Associate **Administrator for Hazardous Material Safety,**  
**Research** and Special Programs Administration  
U. S. Department of Transportation  
400 7<sup>th</sup> Street SW, Room 8436  
Washington DC 20590-001  
Attention: Exemptions, DHM-3 1  
c/o Ms. Ann Mazzullo

  
**from:** Lacey Learson, 10201/MS1120  
Hazardous Material Consultant

**subject:** Emergency Packaging Exemption for Shipping the Multi-spectral **Thermal Imaging (MTI)** Satellite Payload **containing Ammonia Anhydrous**, Helium and Nitrogen compressed **gases**.

**Ref:** 1, Department of Transportation Exemption, DOT E-1 2093, dtd **July 2, 1998**, Subject: DOT-E 12093, Grantee: **Dynatherm Corporation Inc**, Hunt Valley, Maryland.

**Ref:** 2. Memo, R. Akau to **L. Learson**, dtd September **24, 1998**, Subject: **MTI Variable Conductance Heat Pipe Operation**.

**Ref:** 3. Memo, Brian C. **Brock** to **Lacey Learson**, dtd October 1, 1998, Subject: **Exemption** for shipping **Multispectral Thermal Imager (MTI)** Satellite Payload to Los Alamos.

I'am requesting relief from the **Hazardous** Material regulations 49 CFR packaging section 173.304 for shipping the **MTI** Satellite Payload with ammonia **anhydrous** as stated in the DOT exemption E-1 2093. Part of the MTI Satellite Payload identified as **Heat Pipes** containing **ammonia anhydrous** and nitrogen **was manufactured and** shipped to Sandia National Laboratories (SNL) by **Dynatherm** using DOT E-12093 exemption which they are the Grantee, **Sandia** received the heat pipes and attached them to the **MTI Satellite Payload (MTISP)** which has helium **compressed gas** in the **Cryo Cooler** and a nitrogen purge to keep an **on-board** telescope free from contamination **during** transportation in **commerce**.

The DOT exemption E-12093 authorizes **Dynatherm** to transport in commerce **certain** types of liquefied and compressed gases in **non-DOT** specification containers and to **package** for transportation in commerce the **Heat Pipes** (4 ea.) in a non-DOT specification **wooden** box, The heat pipes contains ammonia anhydrous and nitrogen, each heat pipe contains 24 grams (.845 oz) of **ammonia anhydrous @ 125psig** with a volume of 21.5 cu. inches and .0305 gram mole of nitrogen @ 125psig with a volume of 21.5 cu. inches,

c/o Ms. Ann Mazzullo

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September 30, 1998

**Problem encountered with packaging:**

Since the heat pipes **are** part of the MTISP with additional hazards, the original wooden box is not adequate to **contain** the MTISP, **The MTISP engineers** at SNL designed and fabricated **an aluminum-shipping** container for greater protection **of** the MTISP for **transportation in** commerce. The engineers did not **recognize** that the DOT exemption E-12093 only **authorized** the use of a non-DOT specification wooden box, They **assume** by designing and fabricating a much stronger shipping container of aluminum they would be in compliance.

**Description of hazardous material;** ammonia **anhydrous**, 2.2, UN1005, SP13, 96.0 Grams (3.38 oz), nitrogen compressed, 2.2, UN1066, Ltd Qty, 0.122 Gram mole and helium compressed, 2.2 UN1046, Ltd Qty, 10.2 Grams (0.359 oz) and nitrogen compressed, 2.2, UN1066, 234 cu. ft. used for the nitrogen purge.

**Dimensions of MTI Satellite Payload:** height 61" X width 56" X length 63".

Net **mass weight:** 550 pounds

Gross **mass weight:** 1450 pounds

**Regulation from which exempted:** ammonia **anhydrous** packaging section of 49CFR 173.34 (d) container not fitted with **pressure** relief device, 173.302 (a) (1), 173.304 (a) (2) and 175.3 in that non-DOT specification packagings are **authorized**, **Nitrogen** which is used for the purge for the **MTI Satellite Payload** telescope, is **connected** during transportation, 173.301 (d) with a flow rate of ~280cc/min.

**Ref: 1a.** Applicable Safety Requirements **for** the Heat Pipes.

**Ref: 2.** Clarification of how the heat pipes **interface with the cyro** cooler **and** the MTISP. The **cryo** cooler contains 10.2 grams (.359 oz.) of helium @ 250psig with a **volume of .13 cu. inches.**

**Ref: 2a.** Applicable Safety Requirements **for** the **Cryo** Cooler.

**Ref: 3.** Justification for processing the emergency exemption.

**Figure 1.** MTI satellite payload

**Figure 2.** Variable Conductance Heat Pipe (VCHP) operation.

**Figure 3.** Two nitrogen cylinders **will** be **transported** with the MTI payload, only one cylinder will be **used** at a **time**. The cylinders will be **transported** horizontal, secured and **braced** as **shown** and the valves protected by a metal sleeve. The nitrogen **will** flow from the cylinder to a connector **on** the MTI payload by way of a polyethylene hose.

**Figure 4.** Drawing of shipping container.

**Pictures 1-4** show **the four** heat pipes (2 **heat** pipes per pair) attached to the Thermal Radiators (2 **ea.**); **the** Thermal Radiators were attached to the MTI satellite payload at **Sandia National Laboratories.**

**Pictures 5&6** show the actual MTI payload.

**Pictures 7-11** show the shipping container fabricated **from** aluminum.

It is imperative that the requested emergency exemption **be granted** to Sandia National Laboratories **in order** far shipping the MTI satellite payload to Los Alamos National Laboratory **for** special testing and calibration and back to **Sandia**. The emergency exemption is needed by October 9, 1998 to prevent schedule delay (**Ref: 3**). Any help you can render would be very much appreciated. If there is any additional information that I can provide please **do not**

c/o Ms. Ann **Mazzullo**

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September **30, 1998**

**hesitate to** contact me, my phone number is (505) 844-3 144. In order to receive the exemption in **a** timely manner my fax **number** is **(505)844-5013**.

Again, **thank you** for your help.

**LL:10201/MS1120**